Improved Kayaking Ergometer Using a Switch-mode Converter Driven Alternator - DTU Orbit (08/11/2017)

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This paper describes the implementation of a generator as a source of resistance in a modern kayaking ergometer. This ergometer can function as a platform for emulation of the athlete-kayak-paddle system. The system was considered and described. A possible model for digital regulation has also been described. A synchronous-rectified buck converter has been designed to control the current through the rotor and, by extension, the mechanical resistance felt by the oarsman. The circuit was designed to function with a 12V car battery as a supply. Necessary specifications for efficiency and output stability were set, measured and met. The prototype without regulation was presented at the 2015 Kayaking World Cup, and was met with appreciation and positive feedback.

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